

# Geodatabase Replication

## A Real World Example



Scott Davis  
GIS Coordinator  
Sandy City Public Works

Joe Borgione  
AlpineGeographic  
VECC



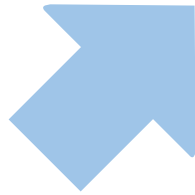
# Outline for Today

- VECC Distributed Database Setup
  - Old Model vs New Model
- City Perspective
  - Creation of Replica
  - Automated Synchronization

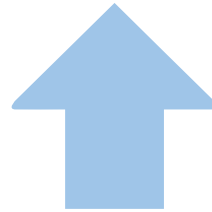
# Original Database Model



SDE Logins Via Internet



City ArcGIS  
Desktop Client



City ArcGIS  
Desktop Client



City ArcGIS  
Desktop Client

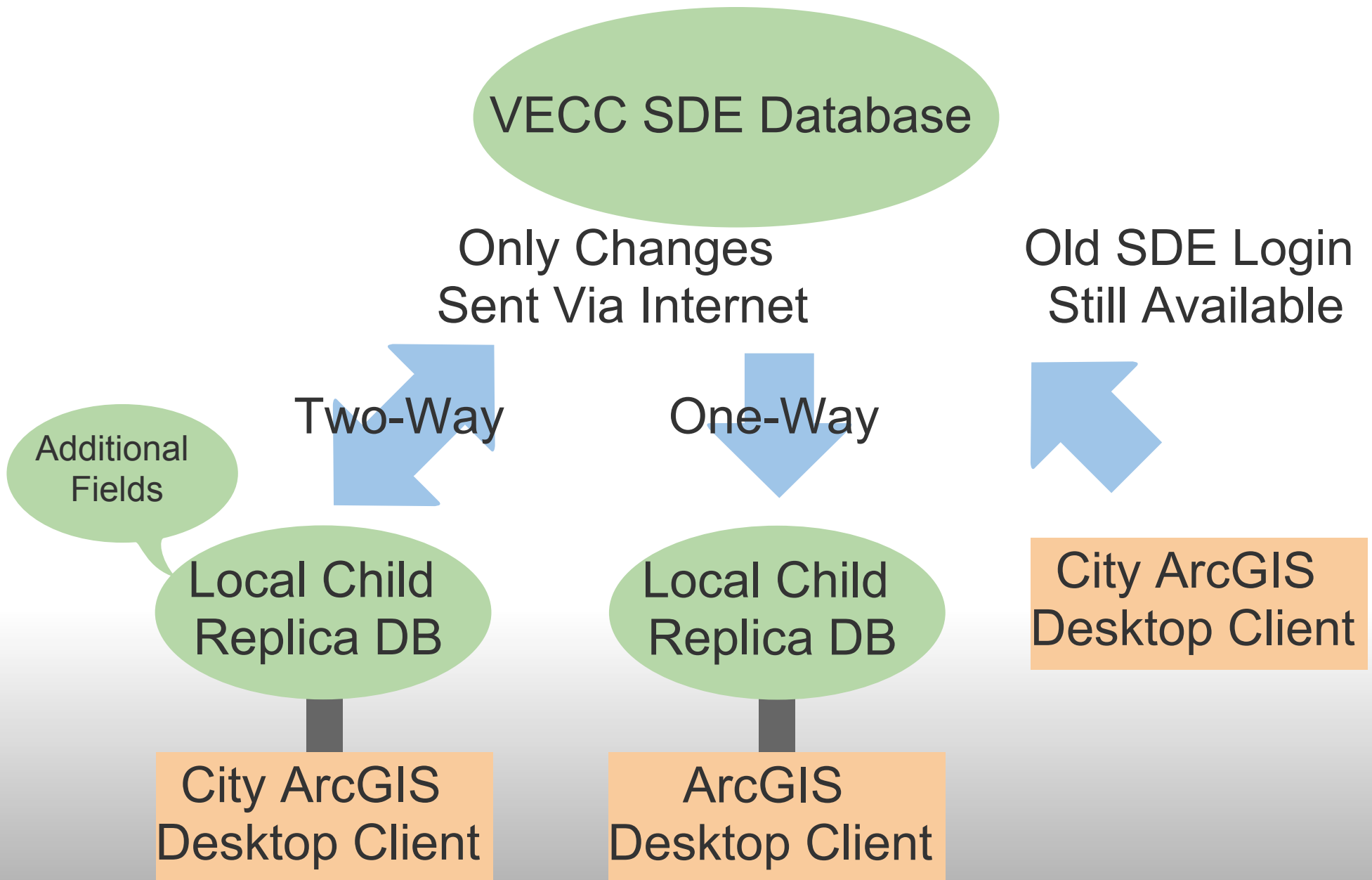
# Pros & Cons

- All data available to all cities 24/7
  - Each city 'owns' their data
- Standardized data format
- Easily retrieved and coupled to CAD
- *Limited to the standardized Attributes*
- *Cities have their own business needs for the data*
- *VECC specific attributes are sensitive*

# New Data Sharing Model

- ESRI's SDE offers database replication
- Through this, a replication of the database can be locally stored
- A set of common attributes are shared
- VECC maintains the sensitive data
- Cities can add their own attributes or relationship classes to the local replication

# New Distributed Database Model



# Common vs Specific Attributes

- Address ranges, Street Names, Prefix, Suffix, Types, Speed Limits, etc
  - These were set up through cooperation between the VECC cities and AGRC at the initial deployment of SDE
- VECC Specific such as Law and Fire zones, stats areas etc
- Cities have their own needs as well
  - Pavement management, traffic counts etc

# The Replication Advantage

- Allows for greater flexibility and use of the data
- Each agency maintains a common set of attributes, plus their own if they want to
  - Only the common attributes are updated through replication
  - Through synchronization, all edits are propagated across to all users

# The Replication Advantage

- Those agencies not wishing to utilize replication do not have to
  - The original SDE edit model is still available
- Non-editing agencies can view the data
- Dovetails into the Utah Geospatial Infrastructure Strategic Plan

# VECC Wrap Up

- Data replication is a new step in VECC's data editing model
- Replication offers some distinct advantages over the original model
- Timely and accurate data sharing today is more important than ever with respect to 9-1-1 response
- All GIS data users can benefit

# Creating a Child Replica

VECC SDE Database

Only Changes  
Sent Via Internet

Old SDE Login  
Still Available

Two-Way

One-Way

Additional  
Fields

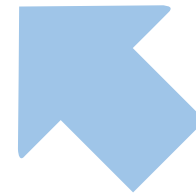
Local Child  
Replica DB

City ArcGIS  
Desktop Client

Local Child  
Replica DB

ArcGIS  
Desktop Client

City ArcGIS  
Desktop Client





Things you can do to a child  
replica...

(undocumented, of course)

# Add/Delete fields without affecting the parent.

Feature Class Properties **Parent Feature Class**

General | XY Coordinate System | Tolerance | Resolution | Domain  
Fields | Indexes | Subtypes | Relationships | Representations

Field Name	Data Type
SOURCE	Text
S_SURF	Long Integer
L_JURIS	Long Integer
R_JURIS	Long Integer
S_ROW	Long Integer
S_ACCESS	Text
S_USE	Text
S_ACCUR	Long Integer
CFCC	Text
ALT_NAME	Text
GlobalID	Global ID
Shape	Geometry
Shape.len	Double

Click any field to see its properties.

Field Properties

Alias	OBJECTID
-------	----------

Import...

To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.

OK Cancel Apply

Feature Class Properties **Child Feature Class**

General | XY Coordinate System | Tolerance | Resolution | Domain  
Fields | Indexes | Subtypes | Relationships | Representations

Field Name	Data Type
CFCC	Text
ALT_NAME	Text
GlobalID	Global ID
Shape	Geometry
STREET	Text
LOW	Double
HIGH	Double
MAINTENANCE	Text
FUNCTIONAL_CLASS	Text
CARTO_CODE	Text
DATA_DATE	Date
DATA_EDITOR	Text
Shape.len	Double

Click any field to see its properties.

Field Properties

Alias	OBJECTID
-------	----------

Import...

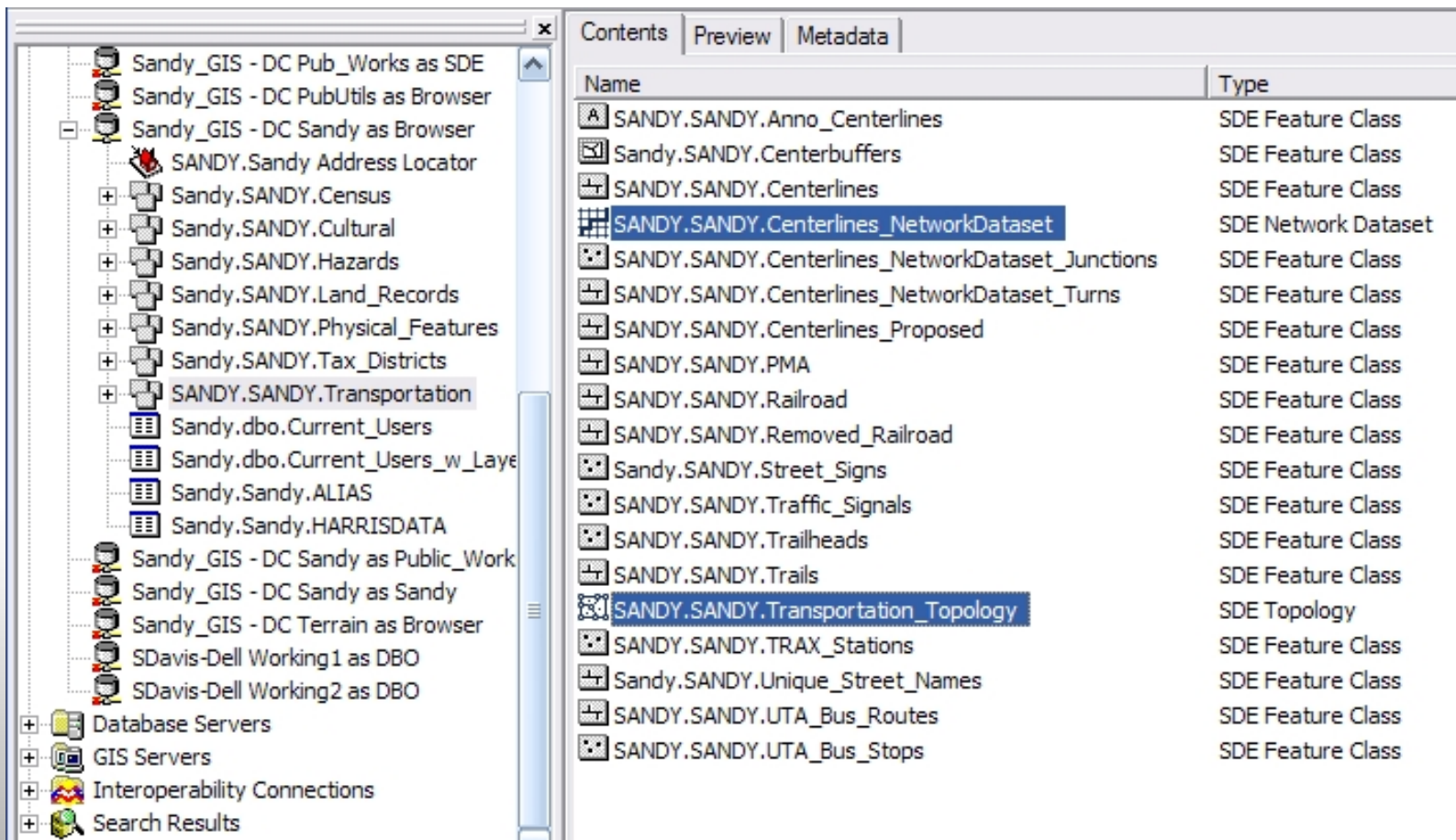
To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.

OK Cancel Apply

# Move it to a Feature Dataset.

Can participate in:

- Topology
- Network Dataset



# Synchronization Using Python

- Easier
- Scheduled Task

The image shows a screenshot of a Windows desktop environment. In the background, a Notepad window titled "SyncWithVECC.pyw" displays a Python script. The script includes comments about synchronizing changes with VECC, variables for database connections, and a function to create a geoprocessor. In the foreground, the "Scheduled Tasks" window is open, showing a list of tasks. A "Scheduled Task Wizard" dialog box is also open, prompting the user to select a start time and day of the week for the task. The wizard shows a start time of 10:28 AM and a frequency of every 1 week, with checkboxes for days of the week (Monday through Sunday).

```
# SyncWithVECC.pyw - G:\GIS\Scripts\SyncWithVECC.pyw
File Edit Format Run Options Windows Help

# Synchronize Changes with VECC
# 7-1-08
# Scott Davis
# scott.sheri@gmail.com

# variables
SandySDE = r"Database Connections\Sandy_GIS - DC Pub_Works as SDE.sde" # Change this to match your local SDE connection in Catalog
Replica = "Sandy_VECC_Replica" # Change this to match the name of the replica that you created
VECC_SDE = r"Database Connections\166.70.83.207 vecc as san.sde" # Change this to match your remote SDE connection to VECC in Catalog
in_direction = "BOTH DIRECTIONS"
conflict_policy = "IN_FAVOR_OF_GDB2" # Resolve conflicts in favor of #2 Database
conflict_definition = "BY_ATTRIBUTE"
emailmessage = ""

import arcgisscripting, _scottmod

print "Creating Geoprocessor..."

gp = arcgisscripting.create()

gp.manage(SandySDE, Replica, VECC_SDE, in_direction, conflict_policy, conflict_definition)

sage = "\n\n" + gp.GetMessages()

"SyncWithVECC.py script has run successfully!\n\n" + emailmessage, "Python - SyncWithVECC.py")

sage + "\n\n" + "ERROR"
sage + "\n\n" + gp.GetMessages()

..
There was an error raised in the SyncWithVECC.py script\n\n" + emailmessage, "Python Error - SyncWithVECC.py")

r..."
```

Technical Article - Schedule a geoprocessing script to run at prescribed times:

<http://support.esri.com/index.cfm?fa=knowledgebase.techarticles.articleShow&d=27553>

# Conclusion - City Perspective

- Faster and Easier Data Maintenance
  - Maintain only one feature class
  - Edit local data
  - "Set it and forget it" data sharing

# Questions?



Joe Borgione  
AlpineGeographic  
801-673-1029  
jborgione@alpinegeographic.com  
VECC  
801-840-4013



Scott Davis  
GIS Coordinator  
Sandy City Public Works  
scott.sheri@gmail.com  
801-568-2989